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(54) CONTAINER FOR FLUORESCENT LIGHT TUBES

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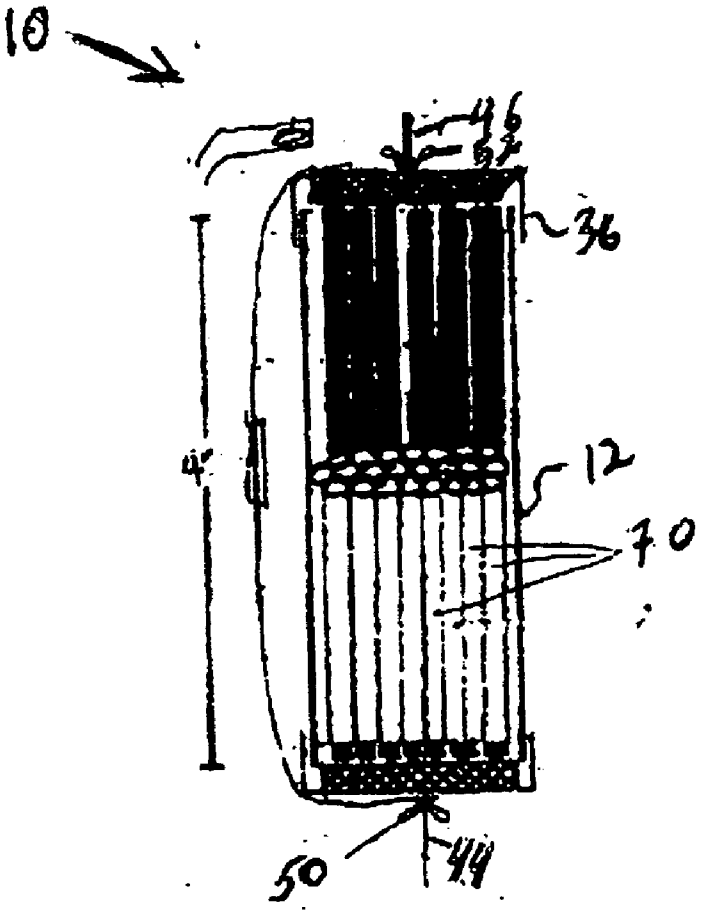
(57) **ABSTRACT**

A container for transporting fragile elongated objects, such as fluorescent light tubes has a tubular body made of rigid non-deformable material. A plurality of tube-receiving sleeves is fitted in the tubular body, each of the sleeves being sized to receive and retain one fluorescent tube. A bottom cap is secured to the bottom of the container body; the bottom cap being fitted with a resilient lining and a soft deformable foam rest fitted over the lining. A top cap, similarly is provided with a resilient lining and a soft deformable rest fitted over the lining. When the fluorescent tubes are positioned in the container body, the electrical connector prongs engage with the deformable rests preventing damage to the connector prongs. A handle is engaged with a rigid retainer rod, which extends through the container body and the opposing caps. The ends of the handle engage the outwardly extending ends of the rod and are secured thereto by nuts. The container can be used for storing and/or transporting a plurality of fragile tubes.



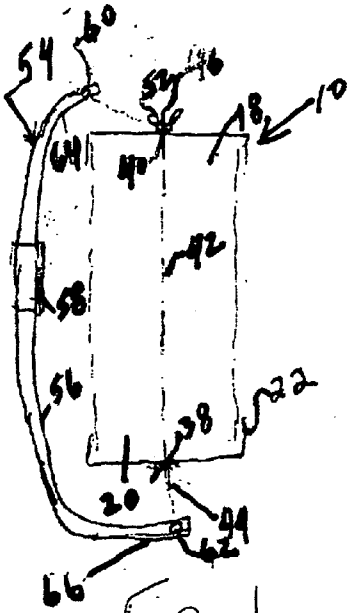


Fig 1

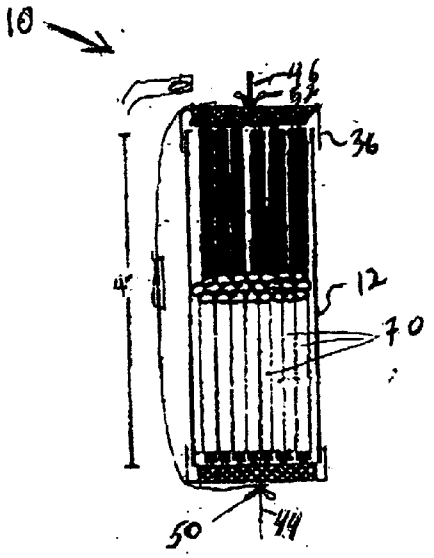


Fig 2

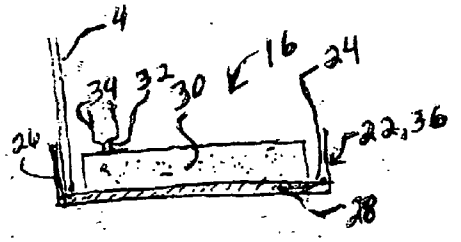


Fig 3

CONTAINER FOR FLUORESCENT LIGHT TUBES

BACKGROUND OF THE INVENTION

[0001] This invention relates generally to fluorescent light tubes, and more particularly to a container for storing and transporting fluorescent light tubes in a safe and convenient manner.

[0002] Fluorescent lights are extensively used in industrial, commercial and residential buildings. The fluorescent light tubes are relatively bulky, usually four feet long. They are very fragile because they have thin glass walls sealed under vacuum. The interior of the glass wall is covered with a powdered material, which creates lots of dust if the tube breaks. The glass shards caused by an imploding glass tube are difficult to clean up. Therefore, efforts are usually made to store and transport both working and burnt out fluorescent tubes.

[0003] Some of the industrial facilities are offshore platforms, where all supplies and equipment are delivered by boats. Loading and unloading of supplies is often conducted in choppy waters and safety of fragile fluorescent tubes is compromised. Considering that supply boats do not service the offshore facilities daily, the supplier delivers dozens of fluorescent tubes at a time, while removing a large number of inoperative light tubes from the offshore facility. Under these conditions, the need for a suitable transportation and storage container capable of holding a large number of light tubes is particularly acute.

[0004] Conventionally, each light tube is sold without a protective cover, which is capable of protecting the glass tube and the thin connector prongs. The burnt out light tubes are either broken before disposal into a waste container or transported onshore (when used on an offshore facility) for future disposal. Care should be exercised when handling burnt out tubes, as well to prevent injury to the maintenance personnel.

[0005] The present invention contemplates elimination of drawbacks associated with prior art and provision of a container that can be used for safe storage and transportation of fragile tubes, such as fluorescent light tubes.

SUMMARY OF THE INVENTION

[0006] It is, therefore, an object of the present invention to provide a container for storage and transportation of fragile tubular objects such as fluorescent light tubes.

[0007] It is another object of the present invention to provide a container capable of holding a plurality of fragile tubular objects such as fluorescent light tubes.

[0008] These and other objects of the invention are achieved through a provision of container device having a tubular body and made of rigid non-deformable material. A plurality of tube-receiving sleeves is fitted in the tubular body, each of the sleeves being sized to receive and retain one fluorescent tube. The sleeves may be shorter than the fluorescent tubes.

[0009] A bottom cap is secured to the bottom of the container body; the bottom cap being fitted with a resilient lining and a soft deformable foam rest fitted over the lining. A top cap, similarly is provided with a resilient lining and a soft deformable rest fitted over the lining. When the fluorescent tubes are positioned in the container body, the electrical connector prongs engage with the deformable rests preventing damage to the connector prongs.

[0010] A handle is engaged with a rigid retainer rod, which extends through the container body and the opposing caps. The ends of the handle engage the outwardly extending ends of the rod and are secured thereto by nuts. The container can be used for storing and/or transporting a plurality of fragile tubes.

BRIEF DESCRIPTION OF THE DRAWINGS

[0011] Reference will now be made to the drawings, wherein like parts are designated by like numerals, and wherein

[0012] FIG. **1** is a perspective, partially exploded view of the container device in accordance with the present invention.

[0013] FIG. **2** is a sectional view of the container device in accordance with the present invention.

[0014] FIG. **3** is a detail sectional view of an end cap of the container device of the present invention.

DETAIL DESCRIPTION OF THE PREFERRED EMBODIMENT

[0015] Turning now to the drawings in more detail, numeral **10** designates the container device of the present invention. As can be seen in the drawings, the container **10** comprises a tubular body **12** formed by a continuous sidewall **14**. In one of the preferred embodiments, the body **12** has a generally cylindrical configuration. The body **12** may be formed of a piece of polyvinyl chloride tubing, which is relatively inexpensive and widely commercially available in various sizes. For the purposes of illustration, and without limitation the tubular body **12** may be made from an 8-inch pipe. However, the body **12** can be formed of other similar suitable materials and have other diameters.

[0016] The body **12** has an inner cavity **16**, a normally open top end **18** and a bottom end **20**. A bottom cap **22** closes the end **20**. The cap **22** may be fixedly attached to the end **20**, such as by adhesive, if desired. The fixed cap **22** has an inner surface **24** and an upwardly extending side **26**, which overlaps, to some distance, the bottom end **20** of the body **12**.

[0017] A resilient lining **28** is positioned on the inner surface **24**; the lining **28** forms a watertight seal with the end **20** when the cap **22** is secured to the end **20**. The lining **28** may be formed from urethane or other similar material. A bottom rest **30** is mounted on top of the lining **28** for supporting bottom prong connectors **32** of a fluorescent light tube **34**. The bottom rest **30** may be formed of soft deformable resilient closed cell foam, such as for instance neoprene. The bottom rest **30** may be sized and configured to be substantially equal in surface area to the lining **28** or may be sized smaller, if desired. A removable top cap **36** is detachably securable on the top end **18**. The cap **36** is a mirror image of the cap **22**; it also has a lining and a soft, deformable prong rest made of soft foam.

[0018] Each cap **22** and **36** is formed with a central through opening **38** and **40**, respectively. A rigid retainer rod **42** is inserted through the openings **38** and **40** to an exterior of the body **12**. The rod **42** is slightly greater in longitudinal dimension than the length of the body **12**, such that opposing ends **44**, **46** of the rod **42** extend outside of the caps **20** and **36**. The ends **42** and **44** are each threaded to engage with a respective wing nut **50**, **52**.

[0019] A handle means **54** is detachably secured to the body **12**. The handle means **54** comprises an elongated band **56**, which may be flexible or semi-rigid, as desired, and a grip portion **58** mounted on the band **56**. An opening **60**, **62** is formed in each of the opposing ends **64**, **66** of the band **56**. A reinforcing grommet surrounds each of the openings **60**, **62**.

[0020] When the container **10** is closed by caps **22**, **36**, and the rod **42** extends through the caps **22**, **36**, the user engages the band **56** with the caps **22**, **36** by sliding the grommets over the ends **44** and **46** of the rod **42**. The user then positions the wing nut **50**, **52** on the respective ends of the rod **42** and tightens the band to the caps **22** and **36**.

[0021] Mounted inside the tubular body **12**, in the cavity **16** is a plurality of light tube receiving sleeves **70**. The sleeves **70** have rigid bodies capable of retaining the fluorescent tubes positioned therein separately. The sleeves **70** are tightly fitted in the cavity **16** and need not be secured to the wall **14** and to each other, although such design can also be provided if desired.

[0022] Each sleeve **70** has a longitudinal dimension, which is smaller than the length of the light tubes **34**. In one of the embodiments, 2-feet long sleeves are provided for receiving 4-feet fluorescent light tubes **34** therein. The exterior diameter of the sleeves **70** can be approximately 1.56", although the dimensions can vary depending on the thickness of the sleeve wall. The sleeves **70** are cylindrical in configuration and each sleeve is adapted for retaining one fluorescent bulb.

[0023] In operation, the user opens the top of the container **10** by removing the wing nut **52** and disengaging the top cap **36** from the body **12**. The user then inserts the tubes **34** into the sleeves **70**, one fluorescent tube per sleeve. The user slightly presses on the tubes **34**, causing the bottom prongs **32** to be slightly embedded in the bottom rest **30**. After all fluorescent tubes **34** have been properly positioned, the top cap is placed over the rod **42**, the band **52** engaged with the rod **42**, and the wing nut **52** secured on the end **46** of the rod **42**. The top prongs of the tubes **34** may become slightly embedded into the top foam rest located in the top cap **36**. The container **10** with the tubes **34** can now be transported to the desired location without danger of the tubes being damaged in transportation.

[0024] The container **10** can be re-used many times for storage and transportation of new or burnt out fluorescent light bulbs. The container **10** can be used for transporting other fragile elongated objects, if desired.

[0025] Many changes and modifications can be made in the design of the present invention without departing from the spirit thereof. We, therefore, pray that our rights to the present invention be limited only by the scope of the appended claims.

We claim:

1. A container device for storing or transporting fragile elongated objects, comprising:

a tubular body having an inner cavity formed therein; and

a plurality of tubular sleeves fitted within the cavity, each of said sleeves being sized and configured for receiving a fragile elongated object.

2. The device of claim 1, further comprising a bottom cap secured to a bottom end of the tubular body and a detachable top cap securable to a top end of the tubular body.

3. The device of claim 2, wherein each of said bottom cap and top cap has an inner surface and a flexible lining is fitted to cover said inner surface.

4. The device of claim 3, wherein said inner lining forms a watertight seal with a respective wall of each of said top cap and the bottom cap.

5. The device of claim 3, wherein a soft deformable rest is fitted in each of said top cap and said bottom cap at least partially covering said inner lining.

6. The device of claim 2, wherein a central opening is formed in each of said top cap and bottom cap.

7. The device of claim 6, further comprising a rigid retaining rod extending through the tubular body and partially extending through the openings in the top cap and the bottom cap when the top cap and the bottom cap are engaged with the tubular body.

8. The device of claim 7, further comprising a handle means for carrying said container, said handle means being engageable with opposing ends of the retainer rod.

9. The device of claim 1, wherein each of said sleeves is formed of a rigid material.

10. The device of claim 1, wherein each of said sleeves has a longitudinal dimension at least slightly smaller than a longitudinal dimension of the elongated object retained therein.

11. A container device for storing or transporting fluorescent light bulbs, comprising:

a tubular body having an inner cavity formed therein;

a plurality of rigid tubular sleeves fitted within the cavity, each of said sleeves being sized and configured for receiving a fluorescent light bulb;

a top cap detachably secured to a top end of the tubular body; and

a bottom cap carried by a bottom end of the tubular body.

12. The device of claim 11, wherein each of said bottom cap and said top cap has an inner surface and a flexible lining is fitted to cover said inner surface; and wherein a soft deformable rest is fitted in each of said top cap and said bottom cap at least partially covering said inner lining, said rest being adapted for engaging with connector prongs of the fluorescent light tubes positioned in the tubular body.

13. The device of claim 12, wherein a central opening is formed in each of said top cap and said bottom cap.

14. The device of claim 13, further comprising a rigid retaining rod extending through the tubular body and partially extending through the openings in the top cap and the bottom cap when the top cap and the bottom cap are engaged with the tubular body.

15. The device of claim 14, further comprising a handle means for carrying said container, said handle means being engageable with opposing ends of the retainer rod.

16. A method of storing and transporting fluorescent light tubes, comprising the steps of:

providing a tubular body having an inner cavity formed therein;

providing a plurality of rigid tubular sleeves, each of said sleeves having interior diameter at least slightly greater than a diameter of a fluorescent light tube;

providing a bottom cap fitted with a soft deformable rest and engaging said bottom cap to a first end of the tubular body;

positioning one fluorescent light tube in a respective sleeve, such that connector prongs of the fluorescent light tube are engaged with the deformable rest;

providing a top cap fitted with a soft deformable rest; and

engaging said top cap to a second end of the tubular body such that opposite connector prongs of the fluorescent light tube are engaged with the deformable rest.

17. The method of claim 16, further comprising the step of providing a handle means and engaging opposing ends of the handle means with the top cap and the bottom cap.

18. The method of claim 16, further comprising the step of providing an inner lining fitted in each of said top cap and said bottom cap between an inner surface of the top cap and the bottom cap and the deformable rest.

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